

1. A method of splicing first and second fiber-optic cables, each having a core and a plurality of strength elements extending around said core, said method comprising the steps of:

- (a) unwinding said strength elements for a distance from one end of said first cable;
- (b) unwinding said strength elements for a distance from one end of said second cable;
- (c) fusing said cores of said cables together at a junction, with said cores in optical alignment with one another;
- (d) rewinding said strength elements on said core of said first cable, overlapping said junction, and replacing said strength elements of said second cable for a distance spaced from said junction; and
- (e) compacting the rewound strength elements with the cores they are wound on.

2. A method as in claim 1 including the step of removing a part of each of said strength elements of said second cable after unwinding them, said parts having lengths different from one another, and cutting each of the strength elements from said first cable to fill the empty spaces left by the removing step.

3. A method as in claim 1 in which said first and second cables are of the same diameter, and in which each cable has an outer cover covering said strength elements, and including the step of removing said outer covers from said ends of said cables before unwinding said strength elements, and including the step of re-covering said ends of said cable to give the resulting cable a substantially uniform diameter over its length.

4. A method as in claim 1 in which said strength elements are resilient helical wires.

5. A method as in claim 1 including inserting each of said strength elements unwound from said first cable into an elongated conduit extending away from said core of said first cable to hold said strength elements away from said core at least during said fusing step.

6. A method as in claim 5 said rewinding step comprising rotating said conduits in a rewinding direction about said core of said first cable while moving said conduits longitudinally of said core toward said junction at a predetermined rate relative to the rate of rotating of said conduits.

7. A method as in claim 6 in which the unwinding of said strength elements from said first cable includes rotating said conduits in a direction opposite said rewinding direction, while

moving said conduits away from said end of said core of said first cable.

8. A method as in claim 1 in which said compacting step comprises passing said rewound strength elements, and the cores on which they are wound, through a die.

9. A method as in claim 6 in which said compacting step comprises passing said rewound strength elements, and the cores on which they are wound, through a die while coupling said die to rotate and move with said conduits.

10. A method as in claim 2 in which the cut ends of the strength elements of said first cable are closely adjacent the cut ends of the strengths elements of said second cable, and applying a quantity of conductive epoxy to each pair of adjacent cut ends to connect said ends together.

11. A method as in claim 3 in which said re-covering step is selected from the group consisting of (a) applying a shrink-wrap cover on said cable and shrink-fitting it in place, and (b) extruding a plastic cover onto the portion of said resulting cable needing it.

12. A method of splicing first and second like cables together to form a continuous cable of substantially uniform

diameter, said first cable having a first fiber optic core, first strength elements wound around said first core, and a first outer cover, said second cable having a second fiber optic core, second strength elements wound around said second core and a second outer cover:

- (a) removing said outer cover from one end of each of said cables;
- (b) unwinding said first strength elements from said first core for a first distance and inserting each into a conduit to hold it away from said first core;
- (c) unwinding said second strength elements from said second core, to different distances;
- (d) cutting the unwound second strength elements at said different distances;
- (e) shortening said first core;
- (f) joining said cores in optical alignment with one another at a junction;
- (g) rotating said conduits while moving them longitudinally towards said junction and beyond;

(h) passing the rewound cable through a die to compact the rewound strength elements and cores together;

(i) cutting each of said first strength elements to the length of the removed second strength element it replaces;

(j) conductively joining the adjacent abutting ends of said first and second strength elements together; and

(k) placing a cover on the portion of the resulting single cable which has none.

13. A method as in claim 12 including first rotating and moving said conduits in a direction opposite that in which said conduits are rotated during rewinding to at least complete the unwinding of said first cable, and coupling said die to travel and rotate with said conduits during rewinding.

14. A fiber optic cable splicing machine for joining together two cables each having a plurality of strength elements wound around a fiber-optic core, said machine comprising:

(a) a storage structure for storing a length of each of a plurality of strength elements unwound from one of said cables to expose a length of the core of said one

cable to enable it to be joined to the core of the other cable;

(b) a winding mechanism for rewinding said strength elements onto said one cable, over a junction at which said cores are joined together, and onto the core of said other cable in place of strength elements removed from the end of said other cable.

15. A splicing machine as in claim 14 including a compacting device positioned to force rewound strength elements toward the core around which it is wound to maintain an even diameter for the joined cables.

16. A splicing machine as in claim 14 in which said storage structure has a plurality of conduits each extending longitudinally of said one cable and having two ends, one end being adjacent said one cable near the point at which one of said strength members meets said one core, said conduits diverging away from said one cable to hold unwound strength members away from the core, said winding mechanism including drive means for rotating said storage structure around said cores while moving said storage structure longitudinally of said cores at a predetermined rate of speed.

17. A splicing machine as in claim 16 in which said strength members are helical wires.

18. A splicing machine as in claim 15 in which said compacting device comprises a die through which the rewound cable is moved.

19. A splicing machine as in claim 18 in which said die is secured to said conduits to move and rotate with said conduits.

20. A splicing machine as in claim 14 including clamps for holding each of said cables during rewinding, each clamp being located at a substantial distance from the ends to be joined.